

## Arrangement for Bearing for a Seat

### Field of the invention

The present invention relates to a mounting for a seat, in particular a chair, but is  
5 also suitable for stools, individual seats on a bench or fixed seats in vehicles or,  
for example, in stadiums or parks. The invention specifically concerns a seat  
mounting which makes it possible for the seat to swing resiliently in all directions  
or in defined directions. Such seats follow the user's posture and, beyond the re-  
silient mounting of the seat cushion, give the seat user a freer feeling of swinging  
10 action.

### Prior art

Mountings for seats are known in a wide range of designs. For work chairs, in  
particular, the capacity for height adjustment and the resilient mounting of the  
15 backrest are standard nowadays (see, for example, WO 98/16140). Many chairs  
are equipped with a synchronizing mechanism, as a result of which a movement  
of the backrest is followed by a simultaneous, synchronous movement of the seat  
surface. The capacity for height adjustment is brought about mostly by a pneu-  
matic spring, while, for the synchronizing mechanisms, use is made of helical  
20 springs, pneumatic springs, torsion rods or combinations thereof (e.g.  
US 5,417,473; EP 0 839 478 A1; WO 00/22961). WO 90/14031 discloses a  
mechanism in which the seat carrier is seated on a ball-and-socket joint, with the  
result that the seat can be rotated and inclined. The set rotary position and incli-  
nation can be arrested by means of a catch. In order to have resilient seat move-  
25 ment in the forward direction, use is also made of rubber bodies which are com-  
pressed between a fixed framework part and the moveable seat carrier as the  
load to which the front seat edge is subjected increases (see, for example,  
US 3,863,982; US 4,890, 886).

30 The chair mechanisms which are relevant to the present invention make it possi-  
ble for the seat to swing resiliently in all directions. Such chairs, stools and the like  
tend to move in the direction of the inclination or shift in the center of gravity of the  
user's body and extend the freedom of movement beyond the resilient mounting

- of the seat cushion, with the result that the seat user feels the swinging action. For this purpose, it has been practised for the central column of the seat to be divided horizontally and for a radially encircling rubber ring to be introduced (see CH 685 848; DE 43 01 734 A1) or for a planar rubber cushion to be arranged 5 between the divided central column (see CH 678 388; US 5,024,485). Either these designs barely provide the desired swinging effect or else the user has a certain feeling of instability and, in the case of deflection, immediately feels that it is harder to sense where the desired movement is going to stop.
- 10 FR 2 514 303 discloses, from the field of mechanical engineering, in particular of engine mounting, a vibration-absorbing arrangement in order to reduce the vibrations to which the framework is subjected. For this purpose, a damping element with a more or less insulating elastomer layer introduced therein is arranged between the vibration source and the framework side. Apart from the fact that this 15 damping element, from a totally different field of expertise, has a quite different task – from mounting a seat – such a damping element is not suitable for mounting a swinging seat.

Object of the invention

- 20 In view of the mountings for a seat with swinging freedom of movement not being fully effective up until now, the object of this invention is to propose such a mounting which is more effective and has an improved service life. It is also the aim here for it to be possible for the mounting to be efficiently mass-produced and instooled in different seats.

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Summary of the invention

- The mounting for a seat which rests on an underframe has a spring element arranged on the underframe. The spring element is positioned in a casing and allows the casing to move elastically in the horizontal plane. The casing is connected to the seat or forms a part thereof. 30

The following features constitute advantageous embodiments of the invention: the spring element is arranged at the top of an axial column of the underframe, pref-

erably on an extensible, axially acting spring. The spring element is intended, in particular, for being arranged at the top of an axially extensible push rod of a pneumatic spring. The spring element has an elastic outer sleeve, e.g. a rubber body. The casing has a bottom, cup-like part in which the spring element is seated. The spring element and the casing have an axial through-passage. Alternatively, the casing, in which the spring element is seated, is a cup-like part which encases the spring element from above.

The spring element comprises an inner, preferably metallic core and the elastic outer sleeve, which is arranged thereon. The core has an opening, preferably an axial through-passage, for accommodating the column. The radial, outer circumference of the outer sleeve of the spring element is preferably cylindrical or tapers conically in the upward direction or is essentially of cylindrical shape with a top and bottom reduction in diameter. The core is fixed to the outer sleeve.

In a variant of the mounting, the spring element is restrained at the top by a top molding, which is connected to the casing arranged at the bottom, the seat being fastened on the top molding. In an alternative variant, the casing, which is positioned on the spring element from above, is fixed to the outer sleeve, it being possible for the casing to have a flange for connection to the seat.

The axial through-passage preferably narrows conically. Provided in the top molding or in the casing, which is positioned on the spring element from above, coaxially with the pneumatic-spring-forming central column, is a through-opening for the purpose of actuating the triggering push rod of the pneumatic spring. In order to limit the moveability of the seat, the through-opening in the top molding or the casing, which is positioned on the spring element from above, has a defined geometry, e.g. a slot. The internal core of the spring element then has an extension which projects into the through-opening and is guided therein.

The specific advantages of the mounting according to the invention are the result of the above set object being achieved, i.e. of the improvements for the user in